## AMENDMENTS TO THE CLAIMS:

The following listing of claims supersedes all prior versions and listings of claims in this application:

## LISTING OF CLAIMS:

1. (Previously Presented) An electronic control apparatus which incorporates a floating-point arithmetic function and performs calculation and control operations in accordance with a predetermined computer program, said apparatus comprising:

a computer;

a memory having stored therein map data that comprises a set of map points expressed in floating-point representation and a set of map values respectively corresponding to said map points and expressed in fixed-point representation;

means for outputting a calculated value of a physical quantity, derived from said map data based on an inputted fixed-point representation value; and

conversion means implemented by executing a computer program on said computer adapted to operate on said map data to selectively convert at least one of said map values from fixed-point representation to floating-point representation data, wherein:

1421600

said set of map values indirectly represent respective values of said physical

quantity, and data expressing said set of map values are of smaller amount than data

which express said set of map points;

said conversion means comprises means for providing a LSB (least significant bit)

conversion value as a floating-point representation value which directly represents a

specific value of said physical quantity, with said specific physical quantity value having

been predetermined as corresponding to a LSB (least significant bit) of said set of map

values; and

said conversion means is adapted to respond to said inputted floating-point

representation value by:

selecting a pair of map points that are respectively close to said inputted floating-

point representation value and that correspond to a specific pair of said map values, and

calculating an interpolation coefficient corresponding to said selected pair of map points,

converting said specific pair of map values to respective floating-point

representation values,

interpolating between said converted pair of map values by a floating-point

calculation utilizing said interpolation coefficient, to obtain an interpolated floating-point

value; and

- 3 -

operating on said interpolated floating-point value with said LSB conversion value, for obtaining a value to be outputted as said calculated value of the physical quantity derived from said map data.


2-6. Cancelled


7. (Previously Presented) An electronic control apparatus according to claim 1 comprising means adapted to provide data expressing an offset value that has been predetermined as corresponding to said set of map values, wherein said interpolated floating-point value is obtained as a logical value, and wherein conversion means is adapted to:

operate on said logical value with said LSB conversion value, to obtain a provisional value of said calculated value of said physical quantity, and

add said offset value to said provisional value, to obtain said floating-point representation calculated value of said physical quantity derived from said map data.


8-9. Cancelled

1421600

10. (Previously Presented) An electronic control apparatus according to claim 1, further comprising:

means for providing ID (identifier) data which express a type of said fixed-point representation data,

wherein said conversion means performs conversion of said floating-point representation data to said fixed-point representation data based on said ID data.

11. (Original) An electronic control apparatus according to claim 1, wherein said conversion means executes said conversion by using a program that is written in assembler language.

12. (Previously Presented) An electronic control apparatus according to claim 1, comprising:

means for providing ID (identifier) data which have been predetermined as corresponding to said map data and which indicate whether or not both said map points and said map values of said map data are expressed in floating-point representation, and

- 5 -

1421600

means for inhibiting said conversion operation of said conversion means when said ID data indicate that both said map points and said map values are expressed in floating-point representation.

13-16. (Cancelled)

17. (Previously Presented) An electronic control apparatus which incorporates a floating-point arithmetic function and performs calculation and control operations in accordance with a predetermined computer program, said apparatus comprising:

a memory having stored therein map data that comprise a set of map points that are expressed in fixed-point representation and a set of map values respectively corresponding to said map points and expressed in floating-point representation,

means for outputting a calculated value derived from said map data based on an inputted floating-point representation value of a physical quantity, and

conversion means implemented by executing said computer program, adapted to operate on said map data to convert said map points from fixed-point representation to floating-point representation data,

wherein:

- 6 -

said set of map points indirectly represent respective values of said physical quantity, and data expressing said set of map points are of smaller amount than data which express said set of map values;

said conversion means comprises means for providing a LSB (least significant bit) conversion value expressed in floating-point representation, directly representing a value of said physical quantity that has been predetermined as corresponding to a LSB of said set of map points; and

said conversion means is adapted to respond to said inputted convert at least one of said map points to floating-point representation value by:

converting said map pints to respective floating-point representation map points, multiplying each of said floating-point representation map points by said LSB conversion value to obtain respectively corresponding values of said first quantity, and selecting a pair of said corresponding physical quantity values that are respectively close to said inputted floating-point representation value and that correspond to a specific pair of said map values,

calculating an interpolation coefficient corresponding to said selected pair of physical quantity values, and

- 7 -

1421600

interpolating between said specific pair of map values by a floating-point calculation utilizing said interpolation coefficient, for obtaining a value to be outputted as said calculated value derived from said map data.


18. (Currently Amended) An electronic control apparatus according to claim 17, further comprising:

means for providing data expressing an offset value that has been predetermined as corresponding to said set of map points,

wherein said conversion means is adapted to:

[[.]]

obtain respective provisional values of said first physical quantity by multiplying said map points by said LSB conversion value, and to obtain said respectively corresponding values of the first physical quantity by adding said offset value to each of said provisional values.